E. C. No. 24

ESTIMATES COMMITTEE

THIRTIETH REPORT

1955-56

MINISTRY OF RAILWAYS

STATISTICAL STUDIES OF CERTAIN RAILWAY PROBLEMS

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CORRIGENDA

THIRTIETH REPORT OF THE ESTIMATES COMMITTEE ON THE MINISTRY OF RAILWAYS

Page 1, para 2, line 4, . . Read "in the 29th report" for "elsewhere".
Page 3, para 9, line 2, Read "or" for "of".
Page 19, para 22, line 3, Read "some" for "same".
Page 19, Para .23, line 4, Read "averages" for "average".
Page 24, par a 44, line 8, Read "items" for "item".
Page 33, Statement 2, Heading, add "per day" after the words "running track miles."
Page 44, para 77, line 2, read "has" for "have ".

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Shri C. S. Swaminathan—*Under Secretary.*

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*Elected Member with effect from the 7th December, 1955 *vice* Shri R. Venkataraman resigned.

INTRODUCTION

I, the Chairman, Estimates Committee having been authorised by the Committee to submit the Report on their behalf present this Thirtieth Report on the Ministry of Railways on the subject "Statistical Studies of certain Railway problems".

2. The Committee wish to express their thanks to the Chairman and Members of the Railway Board and other Officers of the Ministry of Railways for placing before them the material and information that they wanted in connection with the examination of the estimates. They also wish to thank the representatives of the Federation of Indian Chambers of Commerce and Industry, New Delhi, the All India Manufacturers' Organisation, Bombay, the All India Federation of Transport Users' Associations, Bombay, the National Federation of Indian Railwaymen, New Delhi, and Sarva-Shri H. N. Kunzru, M.P., Shanti Prasad Jain, L. P. Misra, K. C. Bakhle, I. S. Puri, V. P. Bhandarkar and B. B. Varma for giving their evidence and making valuable suggestions to the Committee.

BALVANTRAY G. MEHTA,
Chairman, Estimates Committee.

NEW DELHI;
The 8th March, 1956.

A STUDY OF THE COAL CONSUMPTION IN 1953-54 AND 1954-55

The annual coal bill of the Railways is over Rs. 30 crores. In 1954-55, it was about 38 crores. Apart from the increase in price, there has been an increase both in the total quantity consumed as well as in the quantity per unit of service.

2. The various causes for the increase have been examined by the Driver Committee in regard to whose recommendations and the implementation thereof, the Estimates Committee have offered their comments elsewhere. The Driver Committee have analysed the various factors responsible for the deterioration in fuel consumption per unit of service, and have been able to assess approximately the extent of loss caused by each of these factors. Broadly, their conclusions are as follows, as referred to elsewhere in this report:

(i) The excess consumption due to factors beyond the control of the Railway Board, arising from the quality of coal and the sources of supply, has been placed at about 7 per cent.

(ii) Excess due to factors which could be ultimately controlled by the Railway Board by long term measures, has been placed at about 6 per cent.

(iii) Excess due to factors which could be controlled by measures which could be instituted immediately, have been placed at about 6 per cent.

3. To assess, however, the loss suffered by the Railways due to the deterioration in the consumption per unit of service, the Estimates Committee had undertaken an evaluation of the performance statistics in conjunction with costs for the years 1953-54 and 1954-55. At the outset, they proceeded to ascertain how much less the coal Bill would have been in these years if performance could have been maintained at the levels of the best performance years since 1938-39. The price of coal has, however, been taken at the same figure as has been paid in the respective years. The Estimates Committee then studied the problem from another angle by applying the analysis evolved by the Driver Committee to the consumption statistics of 1953-54 and 1954-55.

4. The results of the study are as follows:

At the outset a word may be said regarding the quality of coal supplied to the Railways in respect of which there has been some

deterioration since 1944 compared to the previous years, due to the various reasons which have been fully analysed by the Driver Committee. Since 1947-48, however, the break-up of coal supplied under various grades is available and is shown in Statement 1. It appears from this statement that the percentage of higher grade coal, namely Selected A, Selected B and Grade I has been steadily increasing since 1947-48 as the following figures will show:—

Year	Percentage of higher grade (Selected A, Selected B and Grade I) supply of coal to the Railways.
1947-48	75·1
1948-49	79·3
1949-50	80·3
1950-51	81·6
1951-52	81·6
1952-53	81·9
1953-54	83·1
1954-55	85·7

A reasonable conclusion could, therefore, be drawn from these figures that the supplies have recently been more favourable to the Railways. The whole procedure adopted at present for grading and specification of coal, and its utility for the purpose of assessing the quality of coal required for Railways has, however, been questioned and the Committee do not propose, therefore, to go further into this matter.

5. The most important statistics for determining and controlling coal consumption on railways is expressed in terms of lbs. of coal consumed per 1,000 Gross Ton Miles for Passenger and Goods train services. This indicates the quantity of coal (in lbs.) utilised in performing work equivalent to movement of 1,000 freight tons over a mile. In the case of shunting work the corresponding figure is lbs. per Engine Mile.

6. The following statements are attached to this note:

(1) Quantity of coal of various grades supplied since 1947-48.

(2) Total quantity and cost of coal consumed since 1938-39.

(3) Lbs. of coal consumed per 1,000 Gross Ton miles since 1938-39 on the different operating services.

(4) Railway-wise Passenger and Proportion of Mixed Coal Statistics (B.G.).

(5) Railway-wise Goods and Proportion of Mixed Coal Statistics (B.G.).

(6) Railway-wise Passenger and Proportion of Mixed Coal Statistics (M.G.)

(7) Railway-wise Goods and Proportion of Mixed Coal Statistics (M.G.).

(8) Railway-wise Shunting including siding, all services-coal Statistics (B.G.).

(9) Railway-wise Shunting including siding, all services-coal Statistics (M.G.).

Broad Gauge

Passenger and Proportion of Mixed B.G.

7. Though there has been recently an improvement since 1950-51 on this service (*vide* Statement 3), the performance in 1954-55 is worse than in 1953-54. The best performance since 1950-51 has been on the Central Railway when the figure of 159·6 was reached (*vide* Statement 4). But since that year the Central Railway has also steadily deteriorated; the Eastern Railway has been the worst Railway in this respect and its constituent units of East Indian and Bengal-Nagpur, both come out very badly in comparison.

Goods and Proportion of Mixed B.G.

8. In 1953-54, a figure of 163·3 was attained and compared very unfavourably with many of the pre-war performances, *vide* Statement 3. The 1954-55 figure, however, of 158·8 is much better than the performance in many of the previous years.

Shunting—B.G.

9. In 1953-54, 85·9 lbs. of coal have been consumed per engine mile on B.G. *vide* Statement 8, and this figure has more of less remained steady since 1950-51 and has shown slight improvement in 1954-55.

Metre Gauge

Passenger and Porportion of Mixed M.G.

10. On this service, the performance in 1954-55 is better than in 1953-54, and it has shown considerable improvement over the immediately preceding years. It will be seen, however, from Statement 6, that with the exception of the North Eastern Railway there is a fluctuation in the consumption in the various years on the other Railways.

Goods and Proportion of Mixed M.G.

11. The efficiency of the goods services on the M.G. in regard to coal consumption has recorded the greatest amount of deterioration since 1938-39 with efficiency in 1953-54 being only 75 per cent. of what it was in 1938-39. In 1954-55, however, considerable improve-

ment has been shown. A comparison of the performances of the various Railways has shown that the Western Railway has the worst performance. (*vide* Statement 7).

Shunting—M.G.

12. Though the year 1953-54 showed considerable deterioration in comparison with the previous years on this service, in 1954-55 there has been a slight improvement (*vide* Statement 9). But even this is not so good as in 1950-51 and 1951-52. The deterioration has been common to all the Railways since 1950-51.

Broad and Metre Ganges

13. The percentage increase of coal consumed (lbs. per 1,000 G.T.M.) on the various Services in 1953-54 and 1954-55 over the consumption in 1938-39 is shown in the following table:

Particulars of increases	Broad Gauge		Metre Gauge	
	Passenger and Proportion of mixed	Goods and Proportion of mixed	Passenger and Proportion of mixed	Goods and Proportion of mixed
Percentage increase during 1953-54 over 1938-39	1·3	14·7	12·5	35·7
Percentage increase during 1954-55 over 1938-39.	2·4	11·5	10·6	27·3

It will be seen therefrom that the M.G. services have deteriorated much more than the B.G. services.

Extent of Excess Expenditure

14. The quantity of coal that would have been saved in 1953-54 and 1954-55, had the efficiency of coal consumption been maintained at the best performance in the preceding years since 1938-39, and the monetary savings that could have been effected thereby at the level of prices in those two years is shown below:—

Excess consumption of coal during 1953-54 and 1954-55 over the best performance

Item No. (1)	Service (2)	Actual performance 1953-54 (3)(a)	Actual performance 1954-55 (3)(b)	Best performance (4)	Excess of performance over best performance: Particulars (5)	1953-54 (5)(a)	1954-55 (5)(b)	Total units of service: Particulars (6)(a)	1953-54 (6)(b)	1954-55 (6)(c)	Total excess consumption (in thousands lbs.) 1953-54 (7)(a)	1954-55 (7)(b)
	BROAD GAUGE											
1	Passenger and proportion of mixed	182·5	184·6	168·5	lbs. per 1000 gross ton miles.	14	16	gross ton miles (in millions)	30,000	31,200	420,000	493,200
2	Goods and proportion of mixed	163·3	158·8	142.4	Do	21	16	Do	55,700	60,300	1,169,700	964,800
3	Shunting	85·9	85·4	60.3	lbs. per engine miles	26	25	Engine miles (in thousands)	24,600	25,300	639,600	632,500
	METRE GAUGE											
4	Passenger & proportion of mixed	225·1	221·3	182·4	lbs per 1,000 gross ton miles	42	39	gross ton miles (in millions)	9,760	10,100	409,920	393,900
5	Goods & proportion of mixed . . .	202·7	190·2	146·1	Do	56	44	Do	10,060	10,580	563,360	465,520

(1)	(2)	(3) (a)	(3) (b)	(4)	(5)	(5) (a)	(5) (b)	(6) (a)	(6) (b)	(6) (c)	(7) (a)	(7) (b)
6	Shunting .	50·3	49·4	37·7	lbs. per engine mile	12	11	Engine miles (in thousands)	10,970	10,980	131,640	120,780
								TOTAL . . .			3,334,220	3,076,700

	1953-54	1954-55
Total quantity of coal consumed in excess .	3334 million lbs or 15 lakh tons.	3077 million lbs or 14 lakh tons.
Average cost of coal (including freight) used on Railways	Rs. 32 per ton	Rs. 33 per ton
Total savings that could have been effected .	=Rs. 32x15 lakhs =Rs. 4·80 crores	=Rs. 33x14 lakhs =Rs. 4·62 crores

15. It will be seen therefrom that the deterioration in coal consumption has resulted in about 14 lakh tons more of coal valued at about 4 crores of rupees being consumed during each of the years 1953-54 and 1954-55.

16. On the basis of the assessment made by the Driver Committee that the scope for economy in the Railways on fuel that could be achieved by the various measures recommended by them would be about 20 per cent., the excess expenditure in the two years would work out to about 6 crores. The break-up of this under the three categories of the economy measures referred to above already would be as follows:—

(1) Measures beyond the control of the Railway Ministry	2·2 crores
(2) Long term measures to be introduced by the Railway Board	1·9 crores
(3) Measures that could have been introduced in two or three years	1·9 crores

17. Since the Driver Committee Report was presented only in March 1953, even if the third category of these measures had been instituted immediately thereafter, full results could not, perhaps, have been expected in 1953-54, but some economy could have been effected in 1954-55. It must, therefore, be considered that a substantial portion of the amount of Rupees 1·9 crores could have been saved in 1954-55 had more vigorous steps been taken to institute the measures advocated by the Driver Committee.

18. There is one aspect of coal consumption in 1954-55 which specially requires mention. It is noticed that while the three other services namely, goods and Proportion of Mixed B.G., Passenger and Proportion of Mixed M.G., and Goods and Proportion of Mixed M.G. have shown better results in that year compared to the previous year, on the Passenger and Proportion of Mixed B.G., there has been a deterioration of about 2·1 lbs. per 1,000 G.T.M. compared to 1953-54. Since all the other three services have shown considerable improvement, it would be difficult to explain this fall in performance on the B.G. Passenger services as being due to quality of coal etc. Clearly, therefore, at least 2·1 lbs. of coal per 1,000 Gross Ton Miles (or about 29,280 tons of coal in all) could easily have been saved in that year on this service alone by the operational efficiency being maintained at previous years level in which case the savings to the Railway would have been of the order of about 10 lakhs of rupees.

STATEMENT 1

Quantity of coal of various grades supplied since 1947-48 to 1954-55

Grades	1947-48		1948-49		1949-50		1950-51	
	Tons	Percentage of total	Tons	Percentage of total	Tons	Percentage of total	Tons	Percentage of total
Selected A	859,308	9·6	1,158,832	11·7	1,244,435	12·0	1,070,104	10·3
Selected B	1,629,231	18·1	2,154,491	21·8	2,423,289	23·5	2,637,866	25·3
Grade I	4,261,982	47·4	4,533,986	45·8	4,619,807	44·8	4,785,594	46·0
Grade II	1,428,145	15·9	1,457,662	14·7	1,498,954	14·5	1,357,975	13·1
Grade III A & B	497,827	5·5	205,457	2·1	88,324	·8	105,096	1·0
Small coals . . .	314,453	3·5	385,319	3·9	444,899	4·4	447,578	4·3
Total quantity of coal consumed .	8,990,946	100	9,895,747	100	10,319,708	100	10,404,213	100

Grades	1951-52		1952-53		1953-54		1954-55	
	Tons	Percentage to total	Tons	Percentage to total	Tons	Percentage to total	Tons	Percentage to total
Selected A	1,009,064	9·3	1,108,476	9·9	1,360,322	12·0	1,319,849	11·1
Selected B	2,515,582	23·3	2,571,400	23·1	2,651,404	23·3	2,861,436	24·1
Grade I	5,293,501	48·0	5,432,214	48·9	5,435,001	47·8	5,989,547	50·5
Grade II	1,404,242	13·0	1,420,895	12·8	1,257,889	11·1	1,097,220	9·3
Grade III A & B	89,742	·8	40,755	·4	23,953	·2	15,505	·1
Small coals	495,330	4·6	545,202	4·9	629,436	5·6	570,854	4·9
	10,807,461	100	11,118,942	100	11,358,005	100	11,854,411	100

STATEMENT 2

Total quantity and cost of coal consumed since 1938-39

(1)	(2)			(3)		
	B.G.			M.G.		
	Cost (in crores)			Cost (in crores)		
	(a)	(b)	(c)	(a)	(b)	(c)
Year	Quantity (in tons) (in millions)	At Pit's mouth or station of supply	Including freight both sea and rail	Quantity (in tons) (in millions)	At Pit's mouth or station of supply	Including freight both sea and rail
		Rs.	Rs.		Rs.	Rs.
1938-39	6·28	2·30	6·13	1·50	0·69	2·11
1939-40	6·42	2·29	6·00	1·53	0·67	2·18
1940-41	6·69	2·49	6·58	1·53	0·65	2·15
1941-42	7·38	2·81	7·48	1·65	0·72	2·27
1942-43	7·29	3·09	7·87	1·54	0·74	2.20
1943-44	7·55	5·18	10·66	1·69	1·21	2·95
1944-45	7·65	8·11	15·77	1·92	2·34	4·22
1945-46	8·19	10·45	17·32	2·00	2·79	5·22
1946-47	8·48	10·86	18·02	2·07	2·77	5·47
1947-48	6·79	9·48	14·75	1·74	2·67	5·31
1948-49	7·47	12·01	18·82	1·92	3·23	6·97
1949-50	7·82	12·58	21·55	1·97	3·34	7·67
1950-51	7·87	12·21	20·48	2·21	3·86	8·45
1951-52	8·15	12·41	22·15	2·33	3·89	8·55
1952-53	8·39	13·24	21·26	2·39	4·09	8·53
1953-54	8·55	13·34	25·31	2·47	3·92	9·78
1954-55	8·94	13·85	27·71	2·57	4·38	10·21

STATEMENT 3

Lbs. of Coal consumed per 1000 Gross Ton miles since 1938-39 on the Different Operating Services.

Year	Broad Gauge		Metre Gauge	
	(a) Passenger and proportion of mixed	(b) Goods and proportion of mixed	(a) Passenger and proportion of mixed	(b) Goods and proportion of mixed
1938-39	180·2	142·4	200·1	149·4
1939-40	179·9	142·9	198·1	149·5
1940-41	179·1	143·0	198·9	146·1
1941-42	176·9	149·5	201·5	152·0
1942-43	178·4	157·8	198·8	167·2
1943-44	180·6	164·0	196·4	172·8
1944-45	168·5	159·4	182·4	170·8
1945-46	172·6	162·6	186·3	174·7
1946-47	190·2	168·3	228·4	197·4
1947-48	207·3	177·0	245·7	212·1
1948-49	211·6	175·8	255·0	222·0
1949-50	200·9	169·1	241·6	210·4
1950-51	192·2	164·1	233·9	203·0
1951-52	184·7	160·8	230·7	202·1
1952-53	186·3	166·5	226·8	201·3
1953-54	182·5	163·3	225·1	202·7
1954-55	184·6	158·8	221·3	190·2

STATEMENT 4

Railway-wise Passenger and Proportion of Mixed Coal Statistics (B.G.)

Railways	Lbs. of coal consumed per 1,000 gross ton miles				
	1950-51	1951-52	1952-53	1953-54	1954-55
1. Central	159·6	166·1	167·6	174·1	168·7
2. Eastern	..	..	208·1	202·1	199·4
East Indian	218·1	195·2	..	..	..
Bengal Nagpur	214·7	211·0	..	..	..
3. Northern	..	..	174·0	166·4	178·0
Eastern Punjab	174·9	168·0	..	..	..
4. Southern	194·2	193·7	194·4	190·0	197·8
5. Western	170·0	167·3	168·5	166·5	171·3
TOTAL	192·2	184·7	186·3	182·5	184·6

STATEMENT 5

Railway-wise Goods and Proportion of Mixed Coal Statistics (B.G.)

Railways	Lbs. of coal consumed per 1,000 G.T. Miles				
	1950-51	1951-52	1952-53	1953-54	1954-55
1. Central	174·0	178·1	175·7	172·4	165·3
2. Eastern	..	..	176·4	164·7	156·3
East Indian	146·2	138·1	..	..	..
Bengal Nagpur	185·6	177·8	..	..	..
3. Northern	..	..	140·7	148·3	147·9
Eastern Punjab	190·6	186·6	..	..	..
4. Southern	150·4	153·1	154·8	157·9	160·3
5. Western	172·7	171·3	168·7	173·7	171·4
TOTAL	164·1	160·8	166·5	163·3	158·8

STATEMENT 6

Railway-wise Passenger and Proportion of Mixed Coal Statistics (M.G.)

Railways	Lbs. of coal consumed per 1,000 G.T. Miles.				
	1950-51	1951-52	1952-53	1953-54	1954-55
1. Central	220·8	212·9	202·5	192·1	219·7
2. Northern	..	..	208·4	236·2	198·7
Jodhpur	196·7	197·0	..	..	..
Bikaner	195·3	195·0	..	..	..
3. North-Eastern	..	..	203·6	200·7	186·9
Assam	218·0	192·1	..	..	..
Oudh Tirhut	225·0	213·2	..	..	..
4. Southern	234·4	234·0	235·5	234·7	248·0
5. Western	256·8	267·3	259·4	254·1	243·5
TOTAL	233·8	230·7	226·8	225·1	221·3

STATEMENT 7

Railway-wise Goods and Proportion of Mixed Coal Statistics (M.G.)

Railways	Lbs. of coal consumed per 1,000 G.T. Miles				
	1950-51	1951-52	1952-53	1953-54	1954-55
1. Central	159·3	156·0	173·4	184·7	179·5
2. Northern	..	..	180·2	182·2	168·6
Jodhpur	179·2	184·2	..	..	..
Bikaner	197·4	200·0	..	..	..
3. North-Eastern	..	..	185·9	200·3	171·5
Assam	186·4	175·1	..	..	..
Oudh Tirhut	202·2	204·7	..	..	..
4. Southern	199·1	197·5	202·1	199·3	197·0
5. Western	225·9	228·4	232·6	217·6	215·8
TOTAL	203·0	202·1	201·3	202·7	190·2

STATEMENT 8

Railway-wise Shunting including Siding, All Services-Coal Statistics (B.G.)

Railways	Lbs. of coal consumed per engine mile.				
	1950-51	1951-52	1952-53	1953-54	1954-55
1. Central	89·9	90·8	95·0	97·0	98·9
2. Eastern	..	..	82·5	82·3	82·8
East Indian	85·8	82·7	..	..	..
Bengal Nagpur	79·0	77·9	..	..	..
3. Northern	..	..	80·6	80·7	75·9
Eastern Punjab	101·9	98·4	..	..	..
4. Southern	90·4	96·8	101·6	99·2	93·7
5. Western	78·7	76·9	78·4	77·6	80·4
TOTAL	85·9	85·3	85·7	85·9	85·4

STATEMENT 9

Railway-wise Shunting including Siding , All Services-Coal Statistics (M.G.)

Railways	Lbs. of Coal consumed per engine mile.				
	1950-51	1951-52	1952-53	1953-54	1954-55
1. Central . . .	51·3	43·8	56·7	52·9	55·7
2. Northern	..	..	56·2	65·1	59·5
Jodhpur	42·6	40·1	..	..	
Bikaner	62·0	61·3	..	..	
3. North-Eastern . . .	..	..	41·9	42·0	38·7
Assam	53·1	53·1	..	..	..
'Oudh Tirhut . . .	37·1	34·5	..	..	..
4. Southern . . .	48·6	51·5	54·3	53·7	51·4
5. Western . . .	57·1	57·3	56·7	58·1	58·3
TOTAL . . .	48·5	48·0	49·8	50·3	49·4

II

NUMBER AND COST OF STAFF EMPLOYED ON RAILWAYS

19. The Railway Board publish in Appendix C of volume II of their Report on Indian Railways statistics of the total number and cost of staff as also the number of staff department-wise. All these figures are published separately for each of the Railways under a number of categories. For the purpose of comparison the average wages per employee have been worked out and shown in this Appendix but other figures have been shown without any comparison having been made between Railways on the basis of any units of service, such as, number or cost per train mile, track mile etc. A comparison of the figures of number and cost between various Railways for any one year or of one Railway for a number of years is not of much value as the length of Railway, volume of traffic and other climatic and geographical conditions would affect the comparison. But if any advantage is to be derived from the figures, the compilation of which involves much labour and cost, they have to be examined with reference to some unit of service with a view to find out whether the number of staff employed or the wages paid on any of the Railways are in excess of the requirements. No such review or analysis of the figures appears to have been undertaken by the Railway Board so far.

20. The number and cost of staff employed on Railways under some of the categories have been analysed in terms of wages paid per employee and the number and cost per 1,000 train miles and a comparison has been made of the figures for 1953-54 with those for the last two years. The total number of staff employed on various Railways department-wise on 31st March, 1954, has also been analysed with reference to service units, such as, track miles, train miles, engine miles etc., and compared with the figures for the previous two years. Detailed statements showing these figures are not being submitted with this Report as they form very bulky material, but a brief analysis of the figures is, however, given in the following paragraphs.

21. The Committee hope that a similar examination will be undertaken by the Railway Board in regard to these Statistics for 1954-55 and continued regularly thereafter as otherwise the utility of these statistics for control measures is very little.

I. Total number and annual cost of staff on Railways. Statement

Statement No. I—classes I and II staff

(*i*) *Average* * *wages per employee.*

22. The average wages paid per employee are highest in the Central Railway, *viz.*, Rs. 13,275 in spite of the fact that there has been same decrease as compared with the figures for 1951-52. In the Southern Railway the average which was Rs. 11,903 during 1951-52 has risen to 12,650 during 1953-54. There has been some decrease in the average of Eastern Railway but even then the figures of this Railway are comparatively higher as compared with those of Northern, North-Eastern and Western Railways which are Rs. 11,620, 11,408 and 11,145 per employee respectively. The scales of pay for classes I and II staff are now uniform on all the Railways and unless the variation is due to the fact that highly paid staff of this category happen to be working on some of the Railways at present, the matter requires looking into.

(*ii*) *No. and cost per* 1,000 *train miles.*

23. The number and cost of classes I and II staff per 1,000 train miles is highest on the North-Eastern Railway and the other two Railways on which it is high are the Eastern and Western Railways. The lowest average are on the Southern Railway. It should be examined as to why the figures of the North-Eastern, Eastern and Western Railways cannot be brought down to the same level as those of the Southern Railway.

Statement No. 2—Class III staff on prescribed scales of pay rising to above Rs. 250 *per mensem etc.*

(*i*) *Average wages per employee.*

24. The average wages paid per employee have risen on Eastern Railway from 5,622 during 1951-52 to 5,819 during 1952-53 and Rs. 6,300 during 1953-54. The last figure is highest on all the Railways. The North-Eastern Railway pay the least amount, *viz.*, Rs. 4,753. The remaining four Railways pay between Rs. 5,000 and 6,000 and it will be worthwhile examining as to whether the average of the Eastern Railway cannot be brought down to the same level as on these four Railways.

(*ii*) *Number and cost per* 1,000 *train miles.*

25. Here also the Eastern Railway shows the highest number and cost of staff per 1,000 train miles, *viz.*, ·08 and Rs. 527 respectively, and excepting the Central Railway which has the lowest figures of ·05 and Rs. 295, the averages of the other four Railways are almost uniform and range between ·06 and ·07 and Rs. 338 and

*The figures of averages taken throughout this note include all charges, *viz.* Dearness Allowance, Provident Fund, Gratuity, etc.

380 respectively. The high figures of number and cost on the Eastern Railway require examination.

Statement No. 3—Class III staff—other than workshop and artisan staff on prescribed scales of pay not rising to more than Rs. 250 per mensem etc.

(i) *Average wages per employee.*

26. There has been increase in the average wages paid per employee under this head on all the Railways since 1951-52. The Central Railway paid the highest amount of wages per employee during all the three years but the Northern Railway whose figure was comparatively low during 1951-52 has raised it to the same level as that of the Central Railway. The lowest amount paid per employee was on the North-Eastern Railway. These variations require looking into.

(ii) *Number and cost per* 1,000 *train miles.*

27. The two Railways on which the number and cost per 1,000 train miles is highest are the Eastern and North-Eastern Railways. The Southern Railway's averages are the lowest and a scrutiny might as well be made to bring down the number and cost on the above two Railways to a reasonable figure.

Statement No. 4—Class III wrokshop and artisan staff (highly skilled, skilled and skilled supervisory)

(i) *Average wages per employee.*

28. Excepting the Northern Railway there has been a steady rise in the wages paid per employee on all the Railways since 1951-52 particularly on the Central, Eastern and North-Eastern Railways. The highest amount paid during 1953-54 was, however, on the Eastern and Western Railways, *viz.*, about Rs. 1,800 per annum. The Central, North-Eastern and Southern Railways paid about Rs. 1,600 per annum but the Northern Railway were able to carry on with only Rs. 1,173 per employee per annum. These variations require examination.

(ii) *Number and cost per* 1,000 *train miles.*

29. The number per 1,000 train miles does not show any variations on the Central, Northern, North-Eastern and Southern Railways, *viz.*, ·47, ·44, ·48 and ·49 respectively and while it is somewhat higher on the Western Railway (·58) the number on the Eastern Railway (·89) is almost double that of the other Railways. As regards cost, there are wide variations between the figures of various Railways, *viz.*, Rs. 490 on Northern Railway, about Rs. 800 on Central, North-Eastern and Southern Railways Rs. 1,019 on Western Railway and Rs. 1,542 on Eastern Railway. These variations are

probably due to some of the Railways having larger workshops and doing greater amount of work than others but the matter requires to be examined.

Statement No. 5—Class IV staff—other than workshop and artisan staff

(i) Average wages per employee.

30. The figures under this head are almost uniform on all the Railways but the Northern Railway who paid the lowest wages per employee, *viz.*, Rs. 809 during 1951-52 have raised it to the highest figure, *viz.*, Rs. 1,031 during 1953-54 as against Rs. 900 to 1,000 paid on other Railways. The reasons for this might be investigated.

(ii) Number and cost per 1,000 train miles.

31. The number and cost per 1,000 train miles under this head are highest on the North-Eastern and Central Railways, *viz.*, about 2·80 and Rs. 2,756 respectively as against 2·56 and Rs. 2,630 on the Eastern, 2·46 and Rs. 2,504 on the Northern, 2·26 and Rs. 2,160 on the Western and 2·16 and Rs. 1,980 on the Southern Railway respectively and an investigation might as well be made to find out if the distribution of class IV staff has been made on the same basis on various Railways.

Statement No. 6—Class IV—Workshop and artisan staff (Semi-skilled and unskilled)

(i) Average wages per employee.

32. The Central Railway paid the highest wages per employee during 1953-54, *viz.*, Rs. 1,312 and the Eastern Railway come next with an average of Rs. 1,228. Both the number of staff and the total wages have increased by more than double on the Central Railway since 1951-52. The Northern, Western, North-Eastern and Southern Railways paid Rs. 1,144, 1,025, 1,020 and Rs. 919 per employee respectively. These variations might be looked into.

(ii) Number and cost per 1,000 train miles.

33. There are wide variations in the figures of number and cost on various railways. As in the case of Class III workshop and artisan staff, the Eastern Railway show the largest number of staff and cost, *viz.*, 1·08 and Rs. 1,188 respectively. These figures are more than double of those on the Northern and Southern Railways which are ·45 and Rs. 471 and ·49 and Rs. 414 respectively. The high figures of the number on the North-Eastern Railway and the cost both on this Railway as well as on the Central Railway also require looking into.

Statement No. 7—Total Staff of all categories

(i) Average wages per employee.

34. This statement includes total staff of all categories employed on Railways. There has been a progressive increase in wages paid

per employee on all Railways except on the Southern Railway. The highest amount paid was on the Eastern Railway which has gone up from Rs. 1,417 during 1951-52 to Rs. 1,446 during 1952-53 and Rs. 1,490 during 1953-54. The wages paid per employee on the Western, Northern, Central, Southern and North-Eastern Railways are 1,458, 1,427, 1,417, 1,351 and 1,389 respectively. The reason for the comparatively high figure on the Eastern, Western and Northern Railways require looking into.

(ii) Number and cost per 1,000 *train miles.*

35. The figures of the number and cost of staff per 1,000 train miles show considerable variations between various Railways. The highest figures are on the Eastern Railway, *viz.* 5·94 and Rs. 8,796 followed by that on the North-Eastern Railway which are 5·5 and Rs. 7,320 respectively. The lowest figures are those of the Southern Railway, *viz.*, 4·23 and Rs. 5,613 respectively. The figures of the other three Railways range from 4·43 to 4·84 and Rs. 6,137 to 6,824 respectively. A careful investigation with a view to ascertain the cause of this variation and affecting economy in expenditure, wherever possible, appears to be called for.

II. Total Number of Staff employed on Railways Department-wise

Statement No. 8—Administration Department, No. per track mile

36. The number of staff employed in the Administration Department of the Northern Railway per track mile is nearly three times and that on the Central Railway nearly double of that employed on the remaining four Railways. The reasons. for this large variation require to be investigated.

Statement No. 9—Accounts Department, No. per 1,000 *train miles*

37. The striking feature in this statement is the low number of staff on the Central Railway. The figures of other Railways, though somewhat higher on the Eastern Railway, do not show much variations. The standards obtaining on the Central Railway should be compared with those obtaining on other Railways to see if any economies can be effected on the latter.

Statement No. 10—Engineering Department, No. per track mile

38. Of the two Railways which are situated close to each other, *viz.*, Central and Western, the former has the highest figure of 6·45 men per track mile in the Engineering Department and the latter the lowest, *viz.*, 3·41 per track mile. Other Railways are able to carry on with about 5 employees per track mile. This requires to be investigated with a view to secure uniformity on Railways consistent with safety of Railway Track and economy in expenditure.

Statement No. 11—*Transportion Department, per* 1,000 *train miles*
Statement No. 12—*Commercial Department, per* 1,000 *train miles*

39. As the figures of Commercial Department are included under Transportation on Eastern, North-Eastern and Western Railways the figures of both these departments have been added together for the purposes of comparison. The Central Railway employs the largest number of staff in these departments, *viz.*, 2·00 per 1,000 train miles and this number is 60 to 80 per cent. more than that on other Railways whose figures vary from 1.08 to 1.32. The reasons for the Central Railway employing such a large number of staff require to be examined with a view to effect economy in expenditure.

Statement No. 13—*Mechanical Engineering Department, No. per* 1,000 *engine miles*

40. The number of men employed per 1,000 engine miles in the Mechanical Engineering Department of the Central Railway, *viz.*, ·44 is very low and is about ⅓ or ¼ of that on other Railways. There must be some special reason for this large disparity, which requires investigation. The highest number employed is on the Eastern Railway, *viz.*, 1·61 per 1,000 engine miles.

Statement No. 14—*Stores Department, No. per* 1,000 *train miles*

41. There are wide variations in the number of staff employed per 1,000 train miles on various Railways and an investigation appears to be necessary to ascertain the cause of these variations.

Statement No. 15—*Electrical Department, No. per* 1,000 *train miles*

42. The two Railways which run Electric Trains over their system, *viz.*, Central and Western Railways employ comparative larger staff in this department than other Railways but the reason for North-Eastern Railway having an equally higher figure requires to be looked into.

Statement No. 16—*Medical Department, No. per* 1,000 *train miles*

43. The North-Eastern Railway are incurring the highest expenditure per 1,000 train miles in this department which is nearly seven times that on the Western Railway and about four times that on the Northern Railway and an investigation is called for to ascertain the cause thereof.

III (a)

WAGON STOCK USAGE

44. Various individual operating statistics and the improvement or deterioration of performance in wagon stock usage in recent years have been discussed in the Seventeenth Report of the Committee; there is no need to discuss those items individually again in this study. It is possible, however, to study the combined effect of some of those items on the operational position as a whole and assess their effect in conjunction with costs and earnings. At the same time one or two operational item not already referred to, which have a bearing on the integrated study, may also be discussed.

45. To see how efficiently the Railways have utilised their capacity for the transport of goods, it is sufficient if the following factors are broadly examined, *viz.*,

(i) Track usage;

(ii) utilisation of wagon stock by proper maintenance;

(iii) utilisation of wagons in operation, by loading to the maximum extent possible;

(iv) utilisation of the power capacity by attaching as many wagons as possible on a train; and

(v) utilisation by moving the wagons as much as and as fast as possible.

The statistics to be studied for this purpose are (1) traffic density, (2) percentage of wagons under or awaiting repairs, (3) percentage of average wagon load to average wagon capacity, (4) average number of loaded wagons per goods train and (5) wagon miles per wagon day and average speed of Goods Trains.

46. The following statements are placed at the end of chapter III (b). These statements have been referred to in this chapter also:

(1) Train miles per running Track mile per day—B.G.

(2) Train miles per running Track mile per day—M.G.

(3) Wagon Holdings and Usage—B.G.

(4) Wagon Holdings and Usage—M.G.

(5) Wagon Usage—Work done per unit—B.G.

(6) Wagon Usage—Work done per unit—M.G.

(7) Comparative Efficiency of usage of Wagons in 1953-54 and 1954-55, compared to the performance in 1938-39 and the best performance in other years—B.G.

(8) Comparative Efficiency of usage of wagons in 1953-54 and 1954-55, compared to the performance in 1938-39 and the best performance in other years—M.G.

(I) Traffic density

47. The inter-relation between Traffic Density, speed of goods trains and line capacity has been discussed by the Efficiency Bureau in their Report on "Speed of Goods Trains" to which a reference may be found in the Seventeenth Report of the Committee, as also elsewhere in this Report.

48. By traffic Density is meant the number of Train Miles per running track mile per day and it indicates the extent of usage of Track. Statements I and II show the Traffic Density on the various Railways since 1938-39 for the B.G. and M.G. respectively. The figures for 1927-28, 1928-29 and 1929-30 are also shown in the Tables.

Broad Gauge

49. As far as the Broad Gauge as a whole is concerned, there has been a steady increase in Traffic Density since 1938-39, but the increase has been greater on certain Railways such as the Northern, the *ex*-Nizam State Section of the Central etc. It has been, however, accepted by the Efficiency Bureau that the increase in Traffic Density does not fully explain the fall in operational performances as reflected in speeds of goods trains, and that there has been a certain deterioration in operational efficiency responsible for the poor results.

Metre Gauge

50. On the Metre Gauge system however, the overall Traffic Density shows no increase since 1938-39. The figures for 1938-39 to 1940-41 are slightly above those for 1927-28 and 1929-30; after 1940-41, however, there has been a steady fall during the war years and an increase began to be noticed only from 1948-49. Even in the year 1954-55, the Traffic Density is less than in 1938-39. It

has also been pointed out by the Efficiency Bureau that the utilisation of capacity is very much lower on the M.G. than on the B.G., being only about 50 to 60% in the former, against over 70 in the latter. As regards the individual railways also there is not much improvement in 1954-55 compared to 1938-39. In fact on the Western Railway the Density in 1954-55 is very much less than in 1938-39. It is worthy of note in this connection that the heaviest Traffic Density Railway has been the former South Indian and that the other major sections which have been retained in this country after partition, namely B. &, N.W., *ex*-M. & S.M., S.I., MS., N.S. have all high densities throughout. Of the two Metre Gauge Railways that suffered partition in the Eastern Regions, only 50% or so of the total track mileage went to Pakistan. It has to be concluded, therefore, that generally the areas in the country served by the M.G. have not had the proportionate increase in the traffic than the areas served by the B.G. have had.

(2) Percentage of Wagons under or awaiting repairs

51. This has been discussed in the Seventeenth Report of the Committee, where the extent of deterioration and the measures to be taken for improvement have been stated. The Efficiency Bureau have also made a special study of the problem.

(3) Percentage of Average Wagon Load to Average Wagon Capacity

52. The Average Wagon Load of Goods Trains on the B.G. and M.G. is shown in column 6 of Statements 5 and 6 respectively. There has, however, been a steady increase in the average capacity of the wagons on both the systems, as will be seen from column 8 of Statements 5 and 6 respectively, due to the acquisition of heavier capacity wagons in greater and greater numbers recently. It is necessary, therefore, to study the average wagon load in conjunction with the average capacity of the stock. The percentage of average wagon load to average wagon capacity would accordingly be the more correct figure for assessing the extent of utilisation of wagon stock capacity during operation.

53. One other factor which affects the average wagon load figures is the composition of traffic. Different commodities give different loads for the same weight. The composition of traffic, on the Indian Railways may for this purpose be grouped under three headings, *viz.*, Coal, Grain and Oil-seeds, and "Other Commodities". It appears that coal gives about 22 tons as an average wagon load on the B.G. and grain and oil-seeds near about 18 to 19 tons, but the combined group of other commodities gives an average load less than 15 tons.

54. The percentage of average wagon load to average wagon capacity and the composition of traffic for the years 1938-39 to 1954-55 is shown in the following Table:

Year	B.G.				M.G.			
	Percentage of average wagon load to average wagon capacity	Composition of traffic (Net Ton Miles)			Percentage average of wagon load to average wagon capacity	Composition of traffic (Net Ton Miles)		
		Coal	Grain & Oil seeds	Other commodities		Coal	Grain & Oil seeds	Other commodities
1938-39	58·4	45·6	13·3	41·4	43·0	14·7	23·1	62·2
1939-40	59·4	47·9	12·2	39·9	49·2	15·1	23·1	61·8
1940-41	60·1	48·3	11·8	39·9	49·5	16·5	21·2	62·3
1941-42	63·4	46·2	11·6	42·2	50·6	15·5	21·8	62·7
1942-43	70·1	41·6	10·7	47·7	52·8	14·0	24·7	61·3
1943-44	72·1	42·3	11·9	45·8	55·2	15·4	19·6	65·0
1944-45	69·0	41·5	11·0	47·5	54·7	13·8	17·5	69·7
1945-46	67·5	42·8	9·98	47·2	53·3	14·7	18·2	67·1
1946-47	67·5	46·7	10·8	42·5	50·1	18·0	19·8	62·2
1947-48	68·0	50·0	10·5	39·5	54·1	19·0	19·4	61·6
1948-49	72·2	46·6	12·7	40·7	54·8	17·3	20·5	62·2
1949-50	61·0	44·1	11·5	44·4	55·8	16·3	19·2	64·5
1950-51	73·8	44·0	10·2	45·8	55·9	16·8	17·4	65·8
1951-52	75·2	43·4	11·1	45·6	56·5	16·6	19·0	64·4
1952-53	70·9	43·0	10·3	46·7	58·7	15·9	18·8	65·3
1953-54	72·6	42·3	10·0	47·7	56·9	16·8	16·9	66·3
1954-55	71·8	41·2	9·50	49·3	54·4	16·4	17·9	65·7

55. The comparison shows that while there has been no deterioration in the utilisation of wagon loading capacity, that about 30 per cent. and 45 per cent. of the wagon space of B.G. and M.G. respectively should go unutilised indicates that there is great scope for improvement. The various measures to be taken in this direction have already been referred to in the Seventeenth Report.

(4) Average Number of Loaded Wagons in a Train

56. Column 7 of Statements 5 and 6 indicates the variation in the percentage of wagons loaded to total wagons on a train on the B.G and M. G. respectively since 1938-39. While the performance in 1953-54 was slightly bad compared to some of the previous years, the performance in 1954-55 appears very favourable except in comparison with the war years. Various suggestions have, however been made for the improvement of the available wagon capacity

such as the loading of empty coal wagon on return etc. Conditions of loading of traffic in the war years were no doubt different, but there is every scope for improvement in the number of loaded wagons by improved commercial working, and it should be possible to achieve the figure of 72·9 achieved on the B.G. during the war years. In this connection it is worth noting that on the M.G. the figure for 1953-54 (78·2) was the highest ever exceeding even the performance of the war years, which in fact had been considerably and consistently exceeded after 1945-46. Unfortunately in 1954-55 there has been a small drop compared to 1953-54.

(5) Average Speed of Goods Trains

57. The considerable deterioration that has taken place in this phase of Railway operation has already been referred in the Seventeenth Report of the Committee. As already stated, the Efficiency Bureau have come to the conclusion that inefficiency is a contributing factor to this deterioration, and that the extent of inefficiency is greater on the M.G. than on the B.G.

III (b)

WAGON STOCK UTILISATION IN 1953-54 AND 1954-55

58. The financial effect of the fall in maintenance and usage of wagons, both on the B.G. and M.G. is worked out in the following paragraphs :—

BROAD GAUGE

59. The total number of wagons out of commission during 1953-54 and 1954-55 was 7·30% and 6·79% respectively against 4% only during 1943-44, as shown in item No. 3 of statement 5. In other words 3·30% and 2·79% more wagons respectively of the total number on the line were kept out of commission during these years. This is equivalent to 5,220 and 4,470 wagons being not utilised out of the total available in these 2 years.

60. Items 3, 4 and 5 of statement 7 indicate how the wagons were utilized in the corresponding years. Of the total capacity available in the usage of the wagons, only 74% was the maximum ever utilized in 1951-52 whereas in 1953-54 and 1954-55 the usage has dropped to 72.1 and 71·8% respectively. This means that with better conditions, nearly 2% more traffic could have been carried with the same movement of wagons. Again item 5 of this statement indicates the extent to which empty wagons have been attached on each Goods train. 72·9% of the total wagons on the trains were loaded wagons in 1944-45 whereas for the years 1953-54 and 1954-55 the corresponding figures are 69·3 and 70·3 % respectively, that is to say, 3·6% and 2·6% more wagons could have been loaded wagons on the trains if the operation was the same in 1944-45, which means in turn that about 3% less number of wagons would have been required. Item 3 indicates the distance over which each wagon was moved in a day in the corresponding years and it is seen that against the best performance of 42·9 in 1940-41, 40·1 miles were moved in 1953-54 and 43·3 in 1954-55, resulting in a fall of about 7% during 1953-54 and a rise of about 1% during 1954-55. The net result of this has been to affect the work done in a wagon day; 441 and 483 Net Ton miles were moved in the years 1953-54 and 1954-55 respectively against 463 during 1951-52. There has thus been a fall of about 5% in this matter during 1953-54 and a rise of about 4% during 1954-55.

61. That there has been a fall in efficiency has been accepted, but the quantum of fall is difficult to assess. On an average, however, we may consider that there has been a fall of performance of about 5% during 1953-54 and a net fall of about 2% during 1954-55 due to

inefficiency. The excess capacity required may be considered to be that of about 7,900 and 3,200 wagons according to the holding in 1953-54 and 1954-55 respectively.

62. Combining the performances of the Mechanical and Traffic Departments, therefore, it may be stated that had efficiency been maintained in 1953-54 and 1954-55 at the best performance of the previous years, the traffic moved in those years could have been moved with 13,120 and 7,670 wagons less. As the capital cost per B. G. wagon is about 14,000 Rupees, capital assets of the value of about 18 and 10½ crores may be considered to have been unutilised. At 4% interest this would correspond to about 72 lakhs and 42 lakhs additional revenue expenditure in 1953-54 and 1954-55 respectively.

63. The earning capacity of a B. G. wagon is about Rs. 20 per day. Accordingly the extent to which earnings could have been increased by more efficient working could be placed at about 9½ crores during 1953-54 and 5½ crores during 1954-55 on the B. G.

Metre Gauge

64. Statements 4, 6 and 8 give figures for the M. G. corresponding to statements 3, 5 and 7 of the B. G. From Column 3 of statement 6 it is clear that the maintenance of wagons on the metre gauge, though it has shown slight improvement since 1949-50 has deteriorated considerably in comparison with 1938-39 and 1943-44, the latter of which was the best performance year. The fall in 1953-54 and 1954-55 compared to the best performance year (*vide* item 1 of statement 8) is 62% and 59% against 45% and 41% on the B. G. The Net Ton miles per wagon day which is the Efficiency Index is in fact very much less in 1953-54 and 1954-55 as compared with the previous 2 years and the wagon miles per wagon day which is an index of wagon usage about the worst of all the years since 1938-39 with the exception of 1946-47.

65. Statement 8 shows the comparative efficiency of usage.

If the performance (7·42% and 6·95% during 1953-54 and 1954-55) could have been maintained at the best performance of 2·88 in 1942-43, 4·54% and 4·07% more wagons of those on line would have been available, that is to say, about 2,630 and 2,470 more wagons have been kept out of commission daily than would otherwise have been the case.

66. Item 3, 4 and 5 again represent the extent to which wagons have been utilised in the corresponding years on the M. G. It will be noticed that the ratio of average wagon load to average capacity is, on the whole, very much less on the M. G. than on the B. G. and

that in 1953-54 and 1954-55, only 57 and 54% of the total wagon capacity were utilised against the best performance of 58% during 1952-53. It is clear, therefore, that there is a great scope for improvement in traffic movement in M. G. by better loading. The percentage of loaded wagons which during 1953-54 was the best of all the years since 1938-39 has slightly gone down during 1954-55. Due to the fall in outturn in item 3 and 4 *i.e.*, wagon miles per wagon day and the ratio of average wagon load to average wagon capacity, the Net Ton miles per wagon day—which is the work done index—shows about 5 per cent. less utilisation, which is equivalent to about 2,890 and 3,030 wagons not being utilised at all.

67. Thus combining the performance of maintenance as well as Traffic movement a total of 5,500 wagons may be treated as not utilised during 1953-54 and 1954-55. Rs. 10,000 being taken as the cost of M. G. wagon this is equivalent to a wastage of capital assets of the value of Rs. 5·5 crores in each of the years 1953-54 ond 1954-55. At 4 per cent. interest this gives about Rs. 22 lakhs less per year.

68. Thus, both on the B. G. and M. G., the additional expenditure due to interest on capital not being utilised to the best possible advantage may be considered to be 94 lakhs and 64 lakhs during 1953-54 and 1954-55 respectively.

69. The earning capacity of a M. G. wagon is about Rs. 13 per day. Accordingly the extent to which earnings could have been increased by more efficient working could be placed at about Rs. 2·60 crores in each of the years 1953-54 and 1954-55.

70. The result of the above calculations is shown in the following table:—

Approximate financial results of fall in performance due to inefficiency.

(In lakhs of Rupees)

Year	Excess Revenue Expenditure incurred		Extent to which earnings could have been increased	
	B.G.	M.G.	B.G.	M.G.
1953-54	72	22	950	260
1954-55	42	22	560	260

WAGON HOLDINGS AND USAGE

STATEMENT 1

Train miles per running track mile per day—*BROAD GAUGE*

Years	No.
1927-28	13·5
1928-29	13·7
1929-30	13·5
1938-39	13·4
1939-40	14·0
1940-41	14·4
1941-42	15·0
1942-43	13·0
1943-44	12·5
1944-45	13·7
1945-46	14·7
1946-47	15·2
1947-48	15·4
1948-49	15·4
1949-50	16·6
1950-51	17·0
1951-52	17·6
1952-53	17·4
1953-54	17·6
1954-55	18·1

STATEMENT 2

Train miles per running track miles—*METRE GAUGE*

Years	No.
1927-28	10·3
1928-29	10·1
1929-30	10·5
1938-39	11·4
1939-40	11·4
1940-41	11·3
1941-42	10·9
1942 43	8·90
1943-44	8·84
1944-45	9·53
1945-46	9·67
1946-47	10·3
1947-48	9·59
1948-49	10·2
1949-50	10·5
1950-51	10·5
1951-52	10·8
1952-53	10·9
1953-54	11·0
1954-55	11·1

STATEMENT 3

Wagon Holdings and Usage—B.G.

Sl. No.	Year	Total Net ton miles (millions)	Wagon days (thousands)	Total wagon miles	Loaded wagon miles	Total No. of ordinary wagons for public use	Total special type wagons	Total capacity of ordinary wagons for public use
1	2	3	4	5	6	7	8	9
1	1938-39	18,284	52,056	2,117,936	1,468,051	137,203	11,928	2,934,499
2	1939-40	19,353	52,736	2,203,143	1,521,620	139,276	12,288	2,975,876
3	1940-41	21,041	53,599	2,328,866	1,620,462	139,847	12,555	2,975,138
4	1941-42	23,523	53,320	2,533,041	1,737,529	138,224	12,545	2,949,960
5	1942-43	23,799	52,793	2,277,104	1,585,350	138,419	12,635	2,958,157
6	1943-44	23,820	52,948	2,168,815	1,540,278	139,239	12,986	2,980,298
7	1944-45	23,210	53,001	2,155,858	1,571,201	143,746	13,291	3,080,655
8	1945-46	24,027	55,535	2,339,872	1,662,291	154,021	13,855	3,311,111
9	1946-47	22,762	59,972	2,257,503	1,575,187	159,902	13,941	3,442,250
10	1947-48	17,155	54,353	1,700,577	1,171,691	140,390	12,296	3,030,418
11	1948-49	19,429	54,345	1,807,622	1,239,880	141,022	12,194	3,050,233
12	1949-50	21,704	53,965	2,069,857	1,405,535	138,378	13,709	2,997,384
13	1950-51	23,062	53,550	2,083,382	1,440,671	137,773	13,712	3,007,314

14	1951-52	24,859	53,560	2,203,690	1,530,284	139,034	13,913	3,037,017
15	1952-53	24,360	54,816	2,265,755	1,566,394	141,001	14,528	3,097,651
16	1953-54	24,831	56,718	2,274,339	1,575,605	143,116	15,330	3,132,140
17	1954-55	27,193	56,059	2,448,400	1,721,923	143,547	16,725	3,160,062

STATEMENT 4

Wagon Holdings and Usage—M.G.

Sl. No.	Year	Total Net ton miles (millions)	Wagon days (thousands)	Total wagon miles	Loaded wagon miles	Total number of ordinary wagons for public use	Total special type wagons	Total capacity of ordinary wagons for public use
1	2	3	4	5	6	7	8	9
1	1938-39	3,024	20,633	648,238	470,554	47,234	5,065	634,575
2	1939-40	3,227	20,402	686,266	489,838	47,426	5,098	637,843
3	1940-41	3,368	20,481	695,932	508,177	47,890	5,152	643,756
4	1941-42	3,723	20,394	741,984	545,704	43,009	4,755	580,465
5	1942-43	3,508	19,206	690,291	498,284	42,972	4,619	579,728
6	1943-44	3,811	18,977	717,787	504,942	43,233	4,622	582,985
7	1944-45	4,424	22,275	901,063	602,510	44,265	4,613	597,140
8	1945-46	4,329	27,110	879,049	620,436	45,824	4,736	616,220
9	1946-47	3,444	25,924	693,945	508,651	45,581	4,728	613,440
10	1947-48	2,644	18,468	483,263	371,370	39,175	4,291	525,743
11	1948-49	2,773	16,419	484,419	375,096	38,606	4,250	519,565
12	1949-50	3,041	17,031	525,796	402,290	39,144	4,253	533,120

13	1950-51	.	.	.	.	.	.	3,532	18,831	598,741	[455,944	39,110	4,399	532,455
14	1951-52	.	.	.	.	.	.	3,754	19,253	629,013	479,085	43,955	4,778	596,240
15	1952-53	.	.	.	.	.	.	4,173	20,586	656,336	499,230	50,020	5,367	712,913
16	1953-54	.	.	.	.	.	.	4,306	22,224	645,911	504,945	51,854	6,094	775,833
17	1954-55	.	.	.	.	.	.	4,492	23,212	674,424	523,658	54,291	6,440	857,429

STATEMENT 5

Wagon Usage—Work done per unit—BROAD GAUGE

Sl. No.	Year	Percentage of average No. of unserviceable wagons to total No. on line	Net ton miles per wagon day	Wagon miles per wagon day	Average wagon load	Percentage of wagons loaded to total wagons on the train	Average capacity of a wagon ordinary
1	2	3	4	5	6	7	8
1	1938-39	5·74	451	40·2	12·5	69·3	21·4
2	1939-40	5·72	367	41·3	12·7	69·1	21·4
3	1940-41	5·23	392	42·9	13·0	69·6	21·3
4	1941-42	4·51	441	47·0	13·5	68·6	21·3
5	1942-43	4·43	451	42·5	15·0	69·6	21·4
6	1943-44	4·00	445	39·7	15·3	71·0	21·4
7	1944-45	4·49	438	40·0	14·8	72·9	21·4
8	1945-46	5·26	433	41·6	14·5	71·0	21·5
9	1946-47	6·99	380	39·3	14·5	69·8	21·5
10	1947-48	7·50	351	34·3	14·7	68·9	21·6
11	1948-49	8·10	358	33·1	15·6	68·6	21·6
12	1949-50	7·59	402	38·1	15·4	67·9	21·7
13	1950-51	7·28	434	38·7	16·1	69·2	21·8
14	1951-52	7·40	463	40·9	16·4	69·5	21·8
15	1952-53	7·65	444	41·1	15·6	69·1	22·0
16	1953-54	7·30	441	40·1	15·9	69·3	21·9
17	1954-55	6·79	483	43·3	15·8	70·3	22·0

STATEMENT 6

Wagon Usage—Work done per unit—METRE GAUGE

Sl. No.	Year	Percentage of average No. of unserviceable wagons to total No. on line	Net ton miles per wagon day	Wagon miles per wagon day	Average wagon load	Percentage of wagons loaded to total wagons on the train	Average capacity of a wagon ordinary
1	2	3	4	5	6	7	8
1	1938-39	2·94	147	30·9	6·43	72·6	13·4
2	1939-40	3·60	158	32·9	6·59	71·4	13·4
3	1940-41	3·08	163	33·1	6·63	73·0	13·4
4	1941-42	3·58	182	35·9	6·83	73·6	13·5
5	1942-43	2·88	182	34·7	7·13	71·3	13·5
6	1943-44	3·12	201	36·7	7·55	70·3	13·5
7	1944-45	3·44	199	39·3	7·34	66·9	13·5
8	1945-46	4·36	159	31·5	7·14	70·6	13·4
9	1946-47	7·57	133	28·7	6·77	73·3	13·5
10	1947-48	5·87	162	28·5	7·25	77·1	13·4
11	1948-49	6·89	171	29·1	7·40	78·0	13·5
12	1949-50	8·25	180	29·7	7·58	76·5	13·6
13	1950-51	8·64	186	31·2	7·60	76·4	13·6
14	1951-52	9·39	198	32·4	7·79	76·2	13·6
15	1952-53	8·23	204	31·4	8·36	76·1	14·3
16	1953-54	7·42	194	28·4	8·53	78·2	15·0
17	1954-55	6·95	194	28·4	8·58	77·6	15·8

STATEMENT 7

Comparative Efficiency of Usage of Wagons in 1953-54 and 1954-55 compared to the performance in 1938-39 and the best performance in other years—
BROAD GAUGE

Sl. No.	Item	Performance in 1938-39	Best performance and year		Performance in 1953-54 and 1954-55		Efficiency in 1953-54 and 1954-55 (*i.e.*, Ratio of performance in 1953-54 and 1954-55 compared to best performance)	
			(a)	(b)	1953-54 (a)	1954-55 (b)	1953-54 (a)	1954-55 (b)
1	2	3	4	5	6	7	8	9
1	Percentage of average No. of unserviceable wagons (daily total No. on line)	5·74	4·00	1943-44	7·30	6·79	55%	59%
2	Net ton miles per Wagon Day	351	463	1951-52	441	483	93·9%	103%
3	Wagon miles per Wagon Day	40·2	42·9	1940-41	40·1	43·3	93%	101%
4	Ratio of Average wagon load to Average capacity (general type)	58·4%	74·3%	1951-52	72·1	71·8	97%	96%
5	Percentage of loaded wagons to total on the train	69·3%	72·9% (69·5%	1944-45 1951-52)	69·3%	70·3	95%	96%

STATEMENT 8

Comparative Efficiency of Usage of Wagons in 1953-54 and 1954-55 compared to the performance in 1938-39 and the best performance in other years—
METRE GAUGE

Sl. No.	Item	Performance in 1938-39	Best performance and year		Performance in 1953-54 and 1954-55		Efficiency in 1953-54 and 1954-55 (*i.e.*, Ratio of performance in 1953-54 and 1954-55 compared to best performance)	
			(a)	(b)	1953-54 (a)	1954-55 (b)	1953-54 (a)	1954-55 (b)
1	2	3	4	5	6	7	8	9
1	Percentage of average No. of unserviceable wagons (daily total No. on line)	2·94	2·88	1442-43	7·42	6·95	38%	41%
2	Net ton miles per Wagon day	147	204	1952-53	194	194	95%	95%
3	Wagon miles per Wagon Day	30·9	39·3	1944-45	28·4	28·4	72%	72%
4	Ratio of Average wagon load to Average Wagon capacity (general type)	48%	58%	1952-53	57%	54%	97%	93%
5	Percentage of loaded wagons to total on the train	72·6	78·2 (76·1	1953-54 1952-53)	78·2%	77·6%	100%	99%

IV

LOCOMOTIVE UTILISATION

71. The Efficiency Statistics which are utilised for examining the efficiency of performance in the utilisation of Locomotive power are three, *viz.*, (i) Net Ton Miles per Engine Hour, which indicates the amount of pay load moved on the average by each engine in an hour, (ii) Gross Ton Miles per Engine Hour, which indicates the total amount of load moved, and (iii) Wagon Miles per Engine Hour, which indicates the speed of movement. Consideration of both weight and speed of movement are necessary for judging performance on Railways.

72. The details of operation which ultimately affect the Efficiency Statistics are considered by certain subsidiary statistics some of which have already been examined, each separately, in the Seventeenth Report of the Committee, *e.g.*,

(1) Average Total No. of Locomotives on Line.

(2) Percentage under or awaiting repairs in workshops and sheds.

(3) Engine Miles per Engine Hour in use (according to various services).

(4) Shunting Miles per 100 train Miles in use (according to various services).

(5) Average Train Loads in Tons.

73. The significance of these statistics is as follows:—

Item (1) shows the average total number of locomotives available daily with the Railways.

Item (2) shows how many of them have been incapacitated on the average per day, and are therefore not available for use.

Item (3) shows the extent to which the locomotives have been utilised for purpose of movement of Goods and Passengers.

Item (4) shows the extent to which they were utilised in the shunting services that arose during the course of the movement of Goods and Passengers.

Item (5) shows the extent to which the full powered capacity of the locomotives has been taken advantage of.

The combined effect of all these factors is examined in this study in conjuction with costs.

74. There are, however, two additional items which should also be taken into consideration besides those listed above for the purposes of an integrated study of the extent of utilisation of locomotives. They are: (1) the Average Tractive Effort per Locomotive on Line, and (2) the number of Overaged Stock.

75. Consequent on the Railway Board's policy of acquiring heavier type locomotives in recent years, the total effective power of the locomotives is much greater than is indicated by the mere numbers of Locomotive Stock. The motive power of a Locomotive is expressed in terms of Tractive Effort, which indicates the power that the engine is capable of generating. A steady increase in the Average Tractive Effort of steam Engines between the years 1938-39 and the years following 1950-51 is noticed from the following Table:—

Year	Average Tractive Effort per Engine B.G.	M.G.
1938-39	26,024	14,956
1950-51	28,198	16,536
1951-52	28,552	16,265
1952-53	28,616	16,483
1953-54	28,929	16,871
1954-55	29,143	17,107

In comparing performances, therefore, due weight has to be given to this factor and in the study which follows, this has been done accordingly.

76. The effect of overage stock on operation is two fold; first overaged stock requires greater attention in maintenance with the result that, when an increase occurs in the percentage of overaged stock, without a corresponding increase in repair facilities, it may even at the best efficiency, result in the percentage of engines under or awaiting repairs going up with a corresponding fall in the number of locomotives available for use of haulage. Secondly, even where maintenance is satisfactory, if the locomotives are very old, they may affect operational performances and result in lower output Unfortunately, however, the percentages of overage stock for years prior to 1950-51 are not available, though at present, due to acute shortage of locomotives, they form a substantial portion of the stock. It has, however, to be remembered that there are always some overaged stock on line, as condemnation is not done on mere age basis,

and even after condemnation the stock are not immediately removed or replaced. But due to non-availability of figures of over-age stock for the years prior to 1950-51, a quantitative assessment of the extent to which this factor has contributed to the deterioration in performance statistics is not possible. Moreover, it has also been claimed that the distribution of new Locomotive Stock on the various Railways would have considerable effect on the performance as a whole. Unfortunately, again, statistics regarding this distribution are not readily available, and the Committee have elsewhere stressed the need for such statistics being compiled regularly and shown in the published Reports. But while a study of distribution may give explanations for the deterioration, it would not affect the results of the main comparative study, on the usage of the total available locomotive power on the Railways as a whole in different periods.

77. The effect of Traffic Density on operational performances in general on the Railways have already been considered by the Efficiency Bureau and their results have been referred to in the previous note on Wagon Stock Usage. As mentioned there, the fall in operational performance is to some extent though not fully to be considered as due to operational inefficiency.

78. The following statements are attached:—

(1) Engine Usage and Holding—B.G.

(2) Engine Usage and Holding—M.G.

(3) Efficiency of Locomotive Usage—B.G. (Net Ton Miles per Engine Hour).

(4) Efficiency of Locomotive Usage—M.G. (Net Ton Miles per Engine Hour).

(5) Efficiency of Locomotive Usage—B.G. (Gross Ton Miles per Engine Hour).

(6) Efficiency of Locomotive Usage—M.G. (Gross Ton Miles per Engine Hour).

(7) Efficiency of Locomotive Usage—B.G. (Wagon miles per Engine Hour).

(8) Efficiency of Locomotive Usage—M.G. (Wagon miles per Engine Hour).

(9) Percentage of Engines under or awaiting repairs to total Engines (average on line)—M.G.

(10) Summary of Rolling Stock in Service—B.G.

(11) Summary of Rolling Stock in Service—B.G.

79. A comparison is made in the following paras of the extent of utilisation of power capacity in 1953-54 and 1954-55 as compared to the utilisation in 1938-39.

Broad Gauge

80. The number of locomotives on line in 1953-54 is less than the number in 1938-39 but in 1954-55 it was about the same as in 1938-39. Since the percentage of locomotives under or awaiting repairs was slightly less in 1953-54 than in 1938-39, the number available for use daily has come up to almost the same figure as in 1938-39. The number under or awaiting repairs during 1954-55 is, however, about 1½% less than in 1938-39 and the number available for use daily is accordingly more by 89 in 1954-55 than in 1938-39. The average tractive effort per engine, that is, the haulage capacity of the engine, has gone up by 2900 and 3110 units in 1953-54 and 1954-55 respectively, so that on the basis of tractive effort per engine as in 1938-39 the number in 1953-54 and 1954-55 may be considered to be about 465 and 610 more than in 1938-39.

81. Item 3 of statement 1, namely the percentage of locomotives under or awaiting repairs is an important statistics as it shows the extent of wastage of locomotives due to problems of maintenance. In this respect the figures for 1953-54 and 1954-55 show improvement over the 1938-39 performance.

82. Items 8 to 12 of statement 1 indicate the extent to which the Railways have utilized the power available to them during the respective years and columns 9 and 10 of the statement shows the extent to which utilisation was made in 1953-54 and 1954-55 as compared to 1938-39. Item 9 reveals that except in the case of passenger traffic, there has been marked deterioration in the mileage obtained from each Engine in use daily in 1953-54 and 1954-55 compared to 1938-39 in spite of the increase in average power capacity.

83. Items 10 and 11 show where the deterioration has occurred. The Engines have been kept longer in steam every day but they ran less each hour with the result that there has been considerable waste of fuel also. Item 12 also indicates that a considerable amount of wastage was due to shunting operations.

84. Statements 3, 5 and 7, as already stated, indicate the efficiency of operation in 1953-54 and 1954-55 compared to 1938-39. It will be seen from item 1(c) of these 3 statements that there has been a deterioration in performance of 6%, 18% and 26% respectively in 1953-54 and of 6%, 15% and 24% respectively in 1954-55 and that the performances during 1953-54 and 1954-55 are generally worse than those in the 1st two years of the First plan period.

85. Based on these figures we may consider that on the average there has been a deterioration of about 10 to 15% or about 12% (or 1/8th) of efficiency in 1953-54 and 1954-55 as compared to 1938-39. This means that the traffic actually moved in 1953-54 and 1954-55 could easily have been moved with only 7/8th the number of engines actually on the line so that 650 engines (B.G.) have been kept on line more during 1953-54 and 1954-55 than what was required for the movements actually effected. The capital cost of these represent the value of unutilised assets.

86. Taking now the average cost of B.G. locomotive at about 5 lakhs this would represent capital assets of the value of 32·5 crores of Rupees not being utilised. At 4% interest, this would represent a loss of about 1·3 crores annually to the Railways.

87. As already stated, the causes for the fall in performance are many, but inefficiency in operation has also played a part therein. To what exact extent inefficiency is responsible for this loss of Rs. 1·3 crores is difficult to say.

88. Statements 10 and 11 make a comparison of these efficiency statistics for B.G. and M.G. respectively and of the increase in the average tractive effort for all the years between 1938-39 and 1954-55. The actual performance in terms of Engines of average Tractive effort of 1938-39 is also worked out. It will be seen that the best performance [columns 4(b), 5(b) and 6(b)] was in the years 1939-40 to 1941-42 and the performance in 1953-54 and 1954-55, particularly in the former year, is very low.

Metre Gauge

89. Statement 2 indicates the engine usage and holding on the M.G. in 1938-39 and 1950-51 to 1954-55. It will be seen that there were 446 and 410 more locomotives on line in 1953-54 and 1954-55 compared to 1938-39. But the percentage of number under or awaiting repairs showed a considerable increase in 1953-54 and 1954-55 compared to 1938-39 (Item 3 of the statement) though there has been some improvement in 1954-55 over 1953-54. There has been a rapid fall only since 1945-46 (*vide* statement 9) and the performance of M.G. in this respect is worse than even during the war years. There was in fact a fall in performance of 31% and 21% during 1953-54 and 1954-55 with the result that the number available for use daily in those two years was only 220 and 254 more than in 1938-39.

90. The loss to Railways consequent on this fall in performance is worked out later.

The average tractive effort per engine on the M.G. has also been steadily increasing due to acquisition of heavier type of engines with the result that the engines had on the average 1915 and 2150 units of tractive effort more in 1953-54 and 1954-55 respectively than in 1938-39. Accordingly, therefore, on the basis of tractive effort per engine in 1938-39, the number available in 1953-54 and 1954-55 for use daily should be considered to be not 2262 and 2294, but 2551 and 2624 respectively, that is to say, the railways had 25% and 28% more power available daily for use in 1953-54 and 1954-55 than in 1938-39. It will be seen from item 9 of the statement that per engine the utilisation has in fact been 6% less than in 1938-39 and as in the case of B.G. there has generally been more shunting done in the later years as will be seen from item 12.

91. Statements 4, 6 and 8 indicate the extent of utilisation of available locomotive capacity and it will be seen therefrom that there has been a fall of (1) about 8 and 7% in 1953-54 and 1954-55 respectively in terms of Net Ton miles per engine hour, (2) of 20% and 19% in 1953-54 and 1954-55 respectively, in terms of Gross Ton miles per engine, and (3) of 36 and 35% respectively in those two years in terms of wagon miles per Engine Hour. In these calculations the additional power due to increased tractive effort has been taken into consideration.

92. On the basis of the above figures it would not be deemed unreasonable if we consider that there has been a fall in performance of about 20% on the M.G. in 1953-54 and 1954-55 compared to 1938-39. This means that the traffic actually moved in 1953-54 and 1954-55 could well have been moved with only 80% of the number of engines actually on the line, so that the number of engines (M.G.) kept on the line in excess of what was required for the movements actually effected is about 550 in each of the 2 years.

93. To this number must be added the additional number of engines that would have been available if the performance of the Mechanical Department which is responsible for the number under or awaiting repairs, was what it was in 1938-39. It has already been stated that the percentage of 18·50 and 16·31 in 1953-54 and 1954-55 compare very unfavourably with the percentage of 12·82 in 1938-39. Had the number under or awaiting repairs in 1953-54 and 1954-55 remained at the lower figure, about 5·7% and 3·4% more engines of the number on line would have been available for the Traffic Department.

94. Due to the combined fall in performance both in the Mechanical and Operating Departments, therefore, there has been a waste of capital assets invested in 700 and 640 M.G. engines. Taking

the capital cost of M.G. engines at about 3 lakhs, this means a waste of capital investment of about 21 crores and 19 crores in 1953-54 and 1954-55 respectively. At 4% interest this means about 84 lakhs and 76 lakhs of revenue loss to Railways in these 2 years.

95. As in the case of B.G., the exact extent to which inefficiency apart from other factors has contributed to this additional charge upon the revenues of the Railways is difficult to assess. It may however, be held to be quite substantial.

BALVANTRAY G. MEHTA,

Chairman,
Estimates Committee.

NEW DELHI;

The 8th, March 1956.

STATEMENT I

Engine Usage and Holding—B.G.

Sl. No.	Item	1938-39	1950-51	1951-52	1952-53	1953-54	1954-55	Efficiency of operation in 1953-54 & 1954-55 compared to 1938-39	
1	2	3	4	5	6	7	8	9	10
								1953-54	1954-55
1	Average total No. on line (Steam)	5,247	5,256	5,233	5,226	5,182	5,253	..	..
2	Under or awaiting repairs	988	999	956	937	926	910	..	..
3	Percentage of 2 to 1	18·8%	19·05%	18·26%	17·9%	18·04%	17·32%	10,490	109%
4	Average Total No. available for use daily	4,255	4,257	4,277	4,289	4,246	4,344	..	..
5	Average Tractive Effort per engine	26,024	28,198	28,551	28,616	28,929	29,143	..	..
6	Average Total No. available for use daily on the basis of Average Tractive Effort of 26024 per engine (Base 1938-39)	4,255	4,612	4,692	4,716	4,720	4,865	..	
7	Average increase in Tractive Effort of engines (Base 1938-39)—percentage	100%	108%	110%	110%	111%	115%	..	..
8	Engine miles per day per engine on line	79	76	78	80	83	85	104%	108%
9	Engine miles per day per engine in use :—								
	Passenger	160	155	158	163	166	166	103%	104%
	Mixed	138	116	120	115	114	114	82%	83%
	Goods	99	93	95	94	94	94	94%	95%
	All services	114	107	109	109	112	112	99%	99%

1	2	3	4	5	6	7	8	9	10
10	Engine Hours per day per engine in use (Average No. Steam) (All Services)	9·5	10·3	10·8	11·0	11·5	11·5	121%	121%
11	Engine Miles per engine Hour (All Services)	10·5	9·14	9·08	9·01	8·89	8·88	85%	85%
12	Shunting Miles per 100 Train Miles.—								
	(a) Passenger and proportion of mixed	4·96	6·13	6·13	6·22	6·21	6·48	80%	77%
	(b) Goods and proportion of mixed	33·9	39·8	38·5	39	40·6	39·4	82%	86%
13	No. of Overaged Stock as on the last day of the year		1,155	1,635	1,376	1,576	1,819	..	
14	Proportion of Overaged Stock to stock on line as on the last day of the year		22%	30%	26%	30%	35%	..	..

STATEMENT 2

Engine Usage and Holding —M.G.

S.No.	Item	1938-39	1950-51	1951-52	1952-53	1953-54	1954-55	Efficiency of operation in 1953-54 & 1954-55 compared to 1938-39	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
								1953-54	1954-55
1	Average total No. on line (Steam) . .	2331	2611	2645	2693	2777	2741		..
2	Under or awaiting repairs. .	299	462	419	459	515	447	..	..
3	Percentage of 2 to 1	12·82%	17·16%	16·03%	17·0%	18·50%	16·31%	69%	79%
4	Average Total No. available for use daily. .	8042	2149	2226	2234	2262	2294	..	..
5	Average Tractive Effort per engine. . . .	14956	16536	16265	16483	16871	17,107	..	..
6	Average Total No. available for use daily on the basis of Average Tractive Effort of 14956 per engine (Base 1938-39)	2042	2376	2420	2462	2551	2624	..	
7	Average increase in Tractive Effort of engines (Base 1938-39)—percentage . . .	100%	110%	109%	110%	113%	114%		..
8	Engine miles per day per engine on line.	76	74	75	75	74	76		..
9	Engine miles per day per engine in use—								
	Passenger	130	131	129	129	132	128	101%	98%
	Mixed	105	100	99	94	96	101	92%	96%
	Goods	99	87	88	87	85	85	86%	86%
	All Services	110	104	104	104	103	103	94%	94%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
10	Engine Hours per day per engine in use (Average No. steam) (All Services)	8·7	9·9	10·0	10·2	10·2	10·2	117%	117%
11	Engine Miles per engine Hour (All Services)	10·1	8·97	8·90	8·88	8·90	8·84	88%	87%
12	Shunting Miles per 100 Train Miles—								
	(a) Passenger and proportion of mixed.	4·71	6·34	6·91	6·73	6·22	5·80	76%	81%
	(b) Goods and proportion of mixed	34·3	40·8	41·2	40·8	43·2	43·4	79%	79%
13	No. of overaged stock as on the last day of the year	..	872	881	814	806	770		
14	Proportion of overaged stock to stock on line as on the last day of the year	..	36%	33%	30%	28%	28%	..	..

STATEMENT 3

Efficiency of Locomotive Usage—B.G.

(Net ton miles per Engine Hour)

S. No.	Item	1938-39	1950-51	1951-52	1952-53	1953-54	1954-55
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Efficiency						
1	(*a*) Net ton miles per Engine Hour. . . .	1854	2008	2055	1962	1934	2041
	(*b*) Net ton miles per Engine Hour when equated to Engines of Average Tractive Effort 26024 (Base 1938-39) . . .	1854	1853	1873	1784	1739	1822
	(*c*) Efficiency Factor (base 1938-39—100) . .	100	100	101	96	94	98

STATEMENT 4

Efficiency of Locomotive Usage—M.G.

(Net ton miles per Engine Hour)

S. No.	Item	1538-39	1950-51	1951-52	1952-53	1953-54	1954-55
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Efficiency							
1	(*a*) Net ton miles per Engine Hour.	822	757	767	827	853	871
	(*b*) Net ton miles per Engine Hour when equated to Engines of Average Tractive Effort 14956 (Base 1938-39). .	822	684	705	750	756	761
	(*c*) *Efficiency* Factor (Base 1938-39-100) . . .	100	83	85	91	92	93

STATEMENT 5

Efficiency of Locomotive Usage—B.G.

(Gross Ton miles per Engine Hour)

S. No.	Item	1938-39	1950-51	1951-52	1952-53	1953-54	1954-55
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	(*a*) Gross Ton miles (including weightt of engine) per engine hour. . .	4657	4487	4537	4436	4339	4524
	(*b*) Gross Ton miles (including weight of engine) per engine hour when equated to engines of average Tractive Effort 26024 (Base 1938-39)	4657	4141	4135	4033	3903	4022
	(*c*) Efficiency Factor (Base 1938-39-100) . .	100	89	89	86	83	86

STATEMENT 6

Efficiency of Locomotive Usage—M.G.

(Gross Ton miles per Engine Hour.)

S. No.	Item	1938-39	1950-51	1951-52	1952-53	1953-54	1954-55
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	(*a*) Gross Ton miles (including weight of engine) per engine hour. . .	2204	1887	1900	1978	1996	2051
	(*b*) Gross Ton miles (including weight of engine) per engine hour when equated to engines of average Tractive Effort 14956 (Base 1938-39) . .	2204	1707	1747	1794	1769	1793
	(*c*) Efficiency Factor (Base 1938-39-100) . .	100	77	79	81	80	81

STATEMENT 7

Efficiency of Locomotive Usage—B.G.

(Wagon miles per Engine Hour)

S. No. (1)	Item (2)	1938-39 (3)	1950-51 (4)	1951-52 (5)	1952-53 (6)	1953-54 (7)	1954-55 (8)
1	(*a*) Wagon miles per Engine hour.	215	181	182	183	177	184
	(*b*) Wagon miles per Engine hour when equated to Engines of average Tractive Effort 26024 (Base 1938-39)	215	167	165	166	159	164
	(*c*) Efficiency Factor (Base 1938-39=100) . .	100	78	77	77	74	76

STATEMENT 8

Efficiency of Locomotive Usage—M.G.

(Wagon miles per Engine Hour)

S. No.	Item	1938-39	1950-51	1951-52	1952-53	1953-54	1954-55
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	(*a*) Wagon miles per Engine hour. . . .	176	129	128	130	128	131
	(*b*) Wagon miles per Engine hour when equated to Engines of average Tractive Effort 14956 (Base 1938-39) . . .	176	117	119	118	114	115
	(*c*) Efficiency Factor (Base 1938-39=100) . .	100	66	68	67	65	65

STATEMENT 9

Percentage of Engines under or awaiting repairs to total Engines (average on line) M.G

1935-36	13.39
1936-37	..
1937-38	12.06
1938-39	12.82
1939-40	13.17
1940-41	12.50
1941-42	13.55
1942-43	13.13
1943-44	13.44
1944-45	13.89
1945-46	15.80
1946-47	19.81
1947-48	19.87
1948-49	19.24
1949-50	17.47
1950-51	17.74
1951-52	15.84
1952-53	17.06
1953-54	18.50
1954-55	16.31

STATEMENT 10

Summary of Rolling Stock in Service—B.G.

Year	Average total No. of Engine on line as on 31st March		Average Tractive Effort		Net ton Miles per Engine Hour		Gross Ton miles per Engine Hour		Wagon miles per Engine Hour	
(1)	(2)		(3)		(4)		(5)		(6)	
	Actuals	Average total No. as of Av. Tractive Effort as in 1938-39 (converted)	Actuals (Steam)	Percentage increase over 1938-39	Actuals	Converted to Eng. of Av. Tractive Effort as in 1938-39	Actuals	Converted to Eng. of Av. Tractive Effort as in 1938-39	Actuals	Converted to Eng. of Av. Tractive Effort as in 1938-39
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
1938-39 .	5236	5236	26024	..	1854	1854	4657	4657	215	215
1939-40 .	5232	5232	26093	..	1901	1896	4750	4750	216	216
1940-41 .	5222	5222	26110	..	1976	1969	4841	4841	219	219
1941-42 .	5245	5245	26118	..	1962	1955	4681	4681	211	211
1942-43 .	..	..	..	..	..	..	..	..	..	..
1943-44 .	5285	5338	26356	1	1927	1903	4247	4205	175	173
1944-45 .	5521	5631	26671	2	1847	1802	4155	4073	172	169
1945-46 .	5766	5996	27071	4	1831	1760	4210	4042	178	172
1946-47 .	5842	6075	27146	4	1776	1702	4163	3999	181	175
1947-48 .	..	..	..	..	..	..	..	..	..	..
1948-49 .	5114	5369	27430	5	1846	1788	4190	3970	172	164
1949-50 .	5310	5681	27928	7	1917	1785	4414	4106	183	171
1950-51 .	5256	5662	28198	8	2008	1853	4487	4137	181	167
1951-52 .	5233	5753	28552	10	2055	1873	4537	4084	182	165
1952-53 .	5226	5728	28616	10	1962	1784	4436	3993	183	166
1953-54 .	5182	5751	28929	11	1934	1739	4239	3862	177	159
1954-55 .	5253	5870	29143	12	2041	1822	4524	3980	184	164

STATEMENT 11

Summary of Rolling Stock in Service—M.G.

Year	Average total No. of Eng. on line as on 31st March		Average Tractive Effort		Net Ton Miles per Eng. Hour		Gross Ton Miles per Eng. Hour		Wagon Miles per Eng. Hour.	
(1)	(2)		(3)		(4)		(5)		(6)	
	Actuals	Average total No. as of Av. Tractive Effort as in 1938-39 (converted)	Actuals (Steam)	Percentage increase over 38-39	Actuals	Converted to Eng. of Av. Tractive Effort as in 1938-39	Actuals	Converted to Eng. of Av. Tractive Effort as in 1938-39	Actuals	Converted to Eng. of Av. Tractive Effort as in 1938-39
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
1938-39 .	2319	2319	14956	..	822	822	2204	2204	176	176
1939-40 .	2356	2356	14966	..	846	846	2265	2265	180	180
1940-41 .	2365	2365	14990	..	883	881	2292	2292	182	182
1941-42 .	2212	2210	14846	1	874	880	2251	2229	174	173
1942-43 .	..	..	..	..	..	..	..	..	..	..
1943-44 .	2242	..	14928	..	816	817	2038	2096	154	..
1944-45 .	2526	2601	15484	3	835	806	2159	2094	170	165
1945-46 .	2396	2442	15252	2	800	784	2065	2023	162	159
1946-47 .	2472	2546	15329	3	705	688	1858	..	142	138
1947-48 .	..	..	..	..	..	..	..	..	..	..
1948-49 .	2339	2477	15797	6	693	674	1738	1634	121	115
1949-50 .	2351	2586	16420	10	735	669	1817	1664	127	115
1950-51 .	2490	2730	16536	10	757	685	1887	1700	128	117
1951-52 .	2709	2972	16265	9	767	705	1900	1730	129	119
1952-53 .	2760	3036	16483	10	827	750	1978	1798	130	118
1953-54 .	2775	3137	16871	13	853	757	1996	1737	128	114
1954-55 .	2789	3181	17107	14	871	751	2051	1764	131	110

APPENDIX I

Statement showing the summary of conclusions/recommendations of the Estimates Committee relating to the Ministry of Railways—Statistical studies of certain Railway Problems

S.No.	Reference to para No. in the Report.	Summary of conclusions/recommendations
1	2	3
1	13	The Committee observe from the percentage increase of coal consumed (lbs. per 1,000 gross ton miles) on the various services in 1953-54 and 1954-55 over the consumption in 1938-39 that the metre gauge services have deteriorated much more than the Broad Gauge services.
2	14 & 15	The Committee have worked out the quantity of coal that would have been saved in 1953-54 and 1954-55, had the efficiency of coal consumption been maintained at best performances in the preceding years since 1938-39 and the monetary savings that could have been effected thereby at the level of prices in those two years. They have noticed that the deterioration in coal consumption has resulted in about 14 lakh tons more of coal valued at about 4 crores of rupees being consumed during each of the years 1953-54 and 1954-55.
3	16	On the basis of the assessment made by the Fuel Economy Enquiry Committee that the scope for economy in the Railways on fuel that could be achieved by the various measures recommended by them would be about 20%, the excess expenditure in the two years would work out to about 6 crores. The break-up of this under the three categories of the economy measures referred to by them would be as follows:— 1. Measures beyond the control of the Railway Ministry. . . 2·2 crores.

1	2	3
		2. Long-term measures to be introduced by the Railway Board. 1·9 crores.
		3. Measures that could have been introduced in two or three years. . . . . 1·9 crores.
		The Committee feel that since the Fuel Economy Enquiry Committee Report was presented as early as in March 1953, even if the third category of these measures had been instituted immediately thereafter, full results could not, perhaps have been expected in 1953-54, but some economy could have been effected in 1954-55.
		The Committee, therefore, consider that a substantial portion of the amount of rupees 1·9 crores could have been saved in 1954-55, had vigorous steps been taken to institute the measures advocated by the Fuel Economy Enquiry Committee.
1	18	The Committee would like to mention specially one aspect of coal consumption in 1954-55 which is, that while the other three services namely Goods and Proportion of Mixed B.G., Passenger and Proportion of Mixed M.G., and Goods and Proportion of Mixed M.G. have shown better results in that year compared to the previous year, on the Passenger and Proportion of Mixed B.G. there has been a deterioration of about 2·1 lbs. per 1000 Gross Ton Miles compared to 1953-54. Since all the other three services have shown considerable improvement, it would be difficult to explain this fall in performance on the B.G. Passenger services as being due to quality of coal etc. The Committee are, therefore, of opinion that at least 2·1 lbs. of coal per 1000 Gross Ton Miles (or about 29280 tons of coal in all) could easily have been saved in that year on this service alone by the operational efficiency being maintained at previous year's level in which case the savings to the Railways would have been of the order of about 10 lakhs of rupees.
5	19	The Committee have noticed that the Railway Board publish in appendix C of Volume II of the report on Indian Railways statistics of the total number and cost of staff as also the number of staff department-wise and, that all these figures are published separately for each of the Railways under a number of categories. They have further

1	2	3
		noticed that for the purpose of comparison the average wages per employee have been worked out and shown in this appendix but other figures have been shown without any comparison having been made between Railways on the basis of any unit of service such as, number or cost per train mile, track mile, etc.
		The Committee are of opinion that a comparison of the figures of number and cost between various Railways for any one year or of one Railway for a number of years is not of much value as the length of Railway, volume of traffic and other climatic and geographical conditions would effect the comparison. But if any advantage is to be derived from the figures, the compilation of which involves much labour and cost, they have to be examined with reference to some unit of service with a view to find out whether the number of staff employed or the wages paid on any of the Railways are in excess of the requirements. No such review or analysis of the figures, appears to have been undertaken by the Railway Board so far.
6	20-21	The Committee have analysed the number and cost of staff employed on Railways under some of the categories in terms of wages paid per employee and the number and cost per 1000 train miles and have compared the figures for 1953-54 with the last two years. The total number of staff employed on various Railways department-wise on 31st March, 1954 has also been analysed with reference to service units, such as, track miles, train miles, engine miles, etc. A brief analysis of the figures is given in paras 22 to 43 of the Report.
		The Committee hope that a similar examination will be undertaken by the Railway Board in regard to these statistics for 1954-55 and continued regularly thereafter as otherwise the utility of these statistics for control measures is very little.
7	45—57	The Committee have studied the various statistics with a view to see as to how efficientlythe Railways have utilised their wagon capacity for the transport of goods and would observe as follows:—
		(1) *Traffic Density*
		As far as broad gauge as a whole is concerned, there has been a steady increase in Traffic Density since

1	2	3

1938-39. It has however, been accepted by the Efficiency Bureau that the increase in Traffic Density does not fully explain the fall in operational performances as reflected in speeds of goods trains, and that there has been a certain deterioration in operational efficiency responsible for the poor results.

As regards metre gauge, the overall traffic density shows no increase since 1938-39 and from an examination of the figures since that year it has to be concluded that generally the areas served in the country by the metre gauge have not had the proportionate increase in the traffic than the areas served by the Broad gauge.

(2) *Percentage of Wagons Under or Awaiting Repairs*

This has been discussed in the Seventeenth Report of the Committee, where the extent of deterioration and the measures to be taken for improvement have been stated.

(3) *Percentage of Average Wagon Load to Average Wagon Capacity*

While there has been no deterioration in the untilisation of wagon loading capacity, that about 30 percent and 45 per cent of the wagon space of B.G.& M.G. respectively should go unutilised indicates that there is great scope for improvement.

(4) *Average No. of Loaded Wagons in a Train*

There is great scope for improvement in the number of loaded wagons by improved commercial working and it should be possible to achieve the figure of 72·9 achieved on the broad gauge during the war years.

On the M.G. the figure for 1953-54 (78·2) was the highest ever exceeding even performance of war years but there has been a drop in 1954-55.

(5) *Average speeed of Goods Trains*

There has been considerable deterioration in the speed of goods trains. The Efficiency Bureau have come to the conclusion that inefficiency is a contributing factor to this deterioration, and that the extent of inefficiency is greater on the M.G. than on the B.G.

The Committee have worked out the approximate financial effect of the fall in the maintenance and

1	2	3

usage of wagons due to inefficiency and have arrived at the following figures:—

(*in lakhs of Rupees*).

Year	Excess Revenue Expenditure incurred		Extent to which earnings could have been increased.	
	BG.	M.G.	B.G.	M.G.
1953-54	72	22	950	260
1954-55	42	22	560	260

9	80—95	The Committee have made a comparison of the extent of utilisation of power capacity in 1953-54 and 1954-55 as compared to the utilization in 1938-39 and have noticed that the Railways suffered a loss of about 1·3 crores in each of the years 1953-54 and 1954-55 on the broad gauge and of 84 lakhs and 76 lakhs respectively in the two years on the metre gauge. The exact extent to which inefficiency apart from other factors has contributed to this additional charge upon the revenues of the Railways is difficult to assess. The Committee are, however, of opinion that it may be held to be quite substantial.

GIPD—LAD—188 LS—25-5-56—1,800